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When drugs become weapons

Chemical weapons are banned - or are they? Steve Wright reports on how an exemption to the convention raises questions about their use in law enforcement

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The Moscow theatre siege of October 2002 was fated to end badly. A group of militants demanding Russia's withdrawal from Chechnya invaded the theatre, taking more than 850 hostages. They threatened to blow everyone up; negotiation brought little benefit, apart from the release of some children. Abruptly, as the siege was entering its third day, the Russian secret service pumped a mysterious gas into the theatre, intending to knock out the militants.

It worked - too well. Though 750 hostages were saved, more than 100 died and hundreds more had serious after-effects including deafness and amnesia. The "non-lethal" weapon had proved lethal, with a death toll of 13%. By contrast, with battlefield weapons the overall expected death rate is just 1 in 16, or 6.25%.

Deaths and disabilities

Some of the deaths and disabilities arose because doctors on hand outside to help the hostages as they were brought out did not know precisely what drug had been used. Although the best reckoning now is that it was some form of fentanyl - used widely as a general anaesthetic - only the Russian authorities know. The details have never been published.

The use of that chemical weapon in peacetime could be justified by Russia, which is a signatory to the Chemical Weapons Convention, as being for "domestic law enforcement" - an allowed exemption.

But it raises important questions for doctors as governments become more interested in the use of chemically and biologically active substances for such enforcement. If such a situation were to arise in Britain, should doctors called to the scene before gas was used cooperate with the authorities? The answer isn't as simple as it seems.

Today the British Medical Association (BMA) will release a report on the use of drugs as weapons, marking the third time it has examined the militarisation of medicine and its potential for waging a new form of warfare. The subject has been an issue for at least a decade, but its highly technical nature has kept it out of the public eye.

Meanwhile, military interest in incapacitating biochemical weapons has grown, as the capabilities of pharmaceutical companies have been transformed by developments such as the unravelling of the genome. What once were seen as distinct chemical and biological processes - the function of the lungs or the brain - can now be targeted with increasing precision.

Molecules can be engineered to target processes such as nerve and cardiovascular function. New agents can be designed to act as delivery mechanisms, while not themselves causing disease. New variants can be explored via a mixture of combinational chemistry (which can enable high-capacity screening for thousands of potential functional chemical groups), knowledge of gene structures, microarrays that can be used for rapid testing on DNA

examples, artificial intelligence predictions of toxicity, directed evolution, information about what proteins a gene codes for, bioinformatics and computer modelling of chemical receptor structures.

These developments represent magnificent possibilities for curing disease - but they also facilitate new possibilities for weapons that induce paralysis, fear, pain and subjugation.

The convention does not permit the use of riot agents for waging war. However, "law enforcement" is undefined; and the role of incapacitating agents as counter-terror weapons has opened up a significant loophole. That is being exploited by the fast-expanding field of "non-lethal weapons" - especially in the US, via the Joint Non-Lethal Weapons Directorate at the US Marine Corps' Quantico base, where incapacitating chemicals are presented as humane weapons. Drug syringes that can be fired like bullets, most often used for animal control, are now available in the commercial sector as narcotics guns.

However, as the Moscow siege showed, one person's tranquillisation is another's lethal dose. Yet much larger devices for mass delivery of chemical agents are being prepared, including mortars. There's no way to conceive of that as riot control.

The BMA argues that the role of doctors is to save life, and medical practioners involved in formulating new "calmative-style weapons" are breaching their Hippocratic oath. It is an important point, since once the reluctance to use such biochemical weapons for counter-terrorist or counter-insurgency operations is breached, there will be a rapid evolution of new variants with a wide range of immobilising and pain-inducing effects.

Military researchers are already interested in Endothelin, a protein similar to certain snake venoms, and substance P, a "tachykinin" which can cause intense constriction of the smooth muscle surrounding the lungs. One US study has identified nine different types of neurotransmitter/receptor systems and other classes of compounds including convulsives. Spray them into a crowd, and people would fight for breath - but how could you be sure that there weren't asthmatics in that crowd who could die?

In Britain, the development of law-enforcement chemicals is ostensibly guided by the Himsworth Committee principles, which say riot chemicals should be treated more like drugs than weapons, with full publication of results in scientific journals prior to authorisation. So a British doctor called to a siege where knockout gas was proposed as a solution should, in theory, be able to refer to published medical literature. But will that principle hold elsewhere? Some countries could treat such chemicals as not requiring clinical trials. And if such trials were ever performed, how could the testing against the old, sick or children ever be permitted by a medical ethics committee? Or would it be outsourced to a country less concerned about such niceties for a suitable price?

There are already some cracks in medics' ethical wall. At the Jane's 2005 Conference Less Lethal Weapons Conference in Leeds, Dr Jitka Schreiberova, chief anaesthetist in the department of neurosurgery at Charles University in Prague, discussed her work on transforming anaesthetics into weapons, and her experience of human testing. We can expect more researchers to follow unless strict ethical limits are set. Otherwise, the convention on chemical weapons will be eroded.

Private dangers

Furthermore, the rise of private military companies could pass these technologies to the private sector. Who will regulate them then? However, any use of such "non-lethal" substances even by the authorities could still create problems. In September 2004, pro-Chechen rebels

took more than 1,200 children and adults hostage in Beslan. One of their first acts was to shoot out the windows and set up tripwires linked to explosives, to guard against a gas attack. In the gun battle that ensued, more than 340 were killed and hundreds more wounded. It's hard to say that the "non-lethal" weapons of two years earlier had saved any lives at all.

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